

**NATIONAL GEOLOGICAL AND GEOPHYSICAL  
DATA PRESERVATION PROGRAM  
Fiscal Year 2011**

**FINAL TECHNICAL REPORT**

**From Acquisition to Access:  
Adding to the Online Collection Inventory, creating metadata for the National  
Digital Catalog, and creating a digital infrastructure for an important data  
collection: the WGNHS Township and Range File.**

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**Principal Investigator:** Dr. Thomas J. Evans  
Wisconsin Geological and Natural History Survey  
3817 Mineral Point Road  
Madison, Wisconsin 53705  
[tevans@wisc.edu](mailto:tevans@wisc.edu)

**Submitted to:** Betty Adrian  
Grants Program Manager, NGGDPP  
United States Geological Survey  
Denver Federal Center  
Box 25046, MS 975  
Denver, Colorado 80225  
[badrian@usgs.gov](mailto:badrian@usgs.gov)

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## **Introduction**

The Wisconsin Geological and Natural History Survey (WGNHS, the Survey) received a grant for FY 2011 from the United States Geological Survey (USGS) National Geological and Geophysical Data Preservation Program (NGGDPP, the Program). A Work Plan and Budget for FY 2011 was submitted on June 4, 2011 for the twelve-month period beginning July 1, 2011 through June 30, 2012.

The Work Plan and Budget for FY 2011 identified the following tasks:

- (1) Complete an assessment of WGNHS data collections (over 180 data collections as of Spring 2012) to identify those collections that contain information appropriate for National Digital Catalog (NDC) metadata preparation, in addition to the six collections already described in the Online Collection Inventory;
- (2) Create and upload National Digital Catalog (NDC) – compliant metadata for the following physical data collection: rock thin-sections (P1590);
- (3) Create a digital infrastructure for one large analog collection (the WGNHS Township and Range File) that integrates critical locational and descriptive content for several other data collections, including rock hand samples (P517), rock thin-sections (P1590), rock outcrops, historical photographs, and field notebooks; and
- (4) Prepare and submit the Final Technical Report for the FY 2011 NGGDPP grant to Wisconsin by the end of September 2012.

## **Accomplishments**

### **1. WGNHS Data Catalog**

We have completed an assessment of the WGNHS Data Catalog, our internal database of identifiable collections of materials – both historical and current – which represents a record of our work completed and underway on behalf of the citizens of Wisconsin. Much of the work on the Data Catalog for FY 2012 was completed in the Fall of 2011 and Spring of 2012, at which time 182 different data collections were included in the Data Catalog. Review of these materials preliminarily identified thirteen (13) collections with possible NDC-appropriate data (data identifiable by geographic location with unique geologic information and descriptors). Eight of these collections are potentially suited for the NDC (*see Assessment*). These collections are in addition to the six physical data collections – rock core (P516), rock hand samples (P517), rock cuttings (from water-well drilling)(P518), rock thin-sections (P1590), sediment samples (P1591), and well-construction reports (P1669) – currently a part of Wisconsin's data record in the National Digital Catalog.

## **2. WGNHS P1590 Rock Thin-Sections**

We have uploaded 1,833 rock thin-section entries to the NGGDPP Program Office for adding to the NDC. The selection of these entries was based on a section-by-section review and subsequent data-entry with separate QA/QC review of randomly selected (about 10%) during the Winter of 2011 and Spring of 2012. This number reflects WGNHS-generated thin-sections with adequate locational data and supporting descriptive information for the purposes of the NDC. We have also now identified approximately 400 additional entries for eventual subsequent analysis to hopefully bring these or at least some of these into NDC-compliant status. These additional records can be included in a future upload.

## **3. WGNHS Township and Range File**

We have developed a digital infrastructure of the WGNHS Township and Range File (*see Assessment*).

## **4. Final Technical Report**

We have prepared a Final Technical Report for the State of Wisconsin's FY11 NGGDPP grant (September 2012 ).

# **Assessment of FY 2011 Accomplishments Relative to Work Plan**

## **1. WGNHS Data Catalog**

Our evaluation of the WGNHS Data Catalog materials produced the following breakdown of collections potentially appropriate for generating NDC-compliant metadata. We initially identified thirteen (13) collections for more-detailed evaluation and, once that evaluation was completed, we organized or categorized the collections – essentially establishing priorities consistent with NDC requirements with the assistance of the Wisconsin Geologic Mapping Committee Data Preservation Subcommittee in their role as external advisors for our data preservation activities.

### **A. High Priority**

#### USGS Lake Superior Division Collection

This is a significant collection of physical material – rock hand samples and rock thin-sections – as well as supporting paper documentation in the form of field notebooks prepared by the investigating geologists and ledger books containing megascopic descriptions, microscopic descriptions, and chemical analyses. This collection represents the work of some of the premier USGS geologists engaged in the field and the supporting lab analysis of Precambrian rock during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.

This collection of material is being studied in FY 2012 as part of the WGNHS NGGDPP proposal. As a result of peer review of the proposal, the collection has been included in the National Digital Catalog under the name of Lake Superior Legacy Collection. The USGS

materials were transferred to the WGNHS in the early 1980s by the USGS for storage, curation, and preservation.

#### Wisconsin Emergency Conservation Works Borings

This collection includes data from test wells constructed on state and national forest land holdings between 1935 and 1941 as part of a WPA project to promote forest fire suppression. Test borings were typically very shallow (less than 25 feet in depth) and designed to identify shallow groundwater supplies that are potentially suitable for emergency development of local groundwater resources for use in fire management on the public forests. The data collection includes a summary report, logs of all drilled wells, and an accompanying township and range map showing locations of wells.

The ECW collection is logically a part of WGNHS data collection P1669, well-construction reports, and is currently being entered in to WGNHS Geobase for eventual uploading to the NDC.

#### B. Medium Priority – Future inclusion in NDC likely

#### WGNHS Geologic Field Notebooks

This is a large collection of paper documentation of state geological survey field work from 1897 through 1955, representing the field observations of Wisconsin geology professionals employed by the WGNHS over that span of time. The size of the collection is very large and will probably need to be further subdivided into logical subcollections, perhaps by geologist, by project, and (or) geographic location.

More evaluation of this large collection is necessary, but experience gained from work completed on the Lake Superior Legacy Collection will be valuable in accomplishing this data-preservation activity.

#### WGNHS Road Materials Survey

This is a significant collection of data gathered by WGNHS geologists in cooperation with the Wisconsin Department of Transportation from 1919 to 1961. The collection includes original field notebooks, summaries of locations listing types and quality of road materials, and providing brief summaries of location, type of deposit, and general geology of deposit. This collection includes large-scale county maps which provide reasonable locations of sites though culture (roads, buildings, municipality boundaries) is out of date.

The variety of applicable, or potentially applicable, data-preservation techniques requires additional evaluation before we can contemplate incorporating these data into the NDC in the most cost-effective manner.

#### Alden's 15-minute Field Quadrangle Maps

There are 41 of these quadrangles, mostly in southern Wisconsin, containing information on drill holes and including Quaternary geologic mapping. W.C. Alden is considered one of the most important glacial geologists in Wisconsin geology investigations. We would include scans of the original quadrangles and associated field notes.

### C. Medium Priority – NDC inclusion possible depending on further evaluation

#### Chemical Analyses of Wisconsin Rocks

There are two collections with this same title with different potential metadata content. Some analyses come from the literature and some from masters and doctoral theses. This collection will require further evaluation focused on determining whether or not the variation of potential metadata content and quality is appropriate for the NDC.

#### Wisconsin Mine Maps

In a collaboration with the former US Bureau of Mines, in the late 1980s and early 1990s, the WGNHS supplied originals of several sets of mine maps from all over the state, with a focus on northwest Wisconsin underground iron mines. Maps were scanned and captured on microfiche. Possible incorporation in the NDC is uncertain pending further evaluation, as these maps are available principally on microfiche and use of original maps for scanning using modern technology would be highly preferred .

#### Milwaukee Metropolitan Sewerage District Deep Tunnel Project Data

This collection includes more than 30 3-ring binders of data, photos, and related diagrams describing the details of soil, sediment, and rock information related to the construction and selection of routing for the large complex of underground tunnels used primarily for storm-water control in the vicinity of the City of Milwaukee. Some data is captured as part of WGNHS Rock Core (P516), but most is only available in paper format. Future activity related to this collection is uncertain.

### **Lowest Priority – NDC inclusion unlikely**

#### Wisconsin Outcrop Descriptions

This collection of several dozen outcrop descriptions, published in various publications from 1960 through 2000, may be a useful subset of general Wisconsin outcrops described in WGNHS Field Notebooks, but two factors may indicate their inclusion in the NDC as a separate collection is unlikely. These outcrops will probably be included in any future data collection focused on outcrops and would be separately identified as having published descriptions as part of the metadata for each outcrop included in the collection.

#### Core

This is a collection is several file-drawers of supporting documentation for P516 (Wisconsin Rock Cores) that is related to the acquisition of this core material from core donors. This material is believed to be worth ongoing internal maintenance by the WGNHS, but is not considered to be appropriate or useful for the NDC.

#### DNR metallic mineral exploration drillhole data

This data set was created by the Wisconsin Department of Natural Resources to reflect the abandonment status of metallic mineral exploration drillholes since about 1977 to the present. Abandonment reports include drill hole construction information (borehole size, length of hole,

azimuth of drilling, and general geology including depth to bedrock). Though these are principally paper records, a database of information is available from the DNR. Since 2011, these reports and related documentation are available as PDFs. This is not specifically a WGNHS data collection – it is maintained by different state agency.

#### Peters Cross-sections

This is a set of 57 cross-sections prepared to support outreach and support work by former WGNHS Geological Survey specialist Roger M. Peters. These cross-sections represent some of the data and related geological interpretations used by Peters to support the development of geologic logs that are based on examination of water-well cuttings submitted to the WGNHS and represented in part in P518, rock cuttings. The cross-sections are in various stages of completeness, and Peters has now retired (as of 2012) making completion of the set unlikely.

#### M. E. Ostrom Type Sections

This is a collection of secondary-source material prepared on 89 index cards by former State Geologist Dr. Meredith E. Ostrom in the 1960s. Each card lists a particular outcrop section, stratigraphic name, bedrock description, location, naming geologist, date, and place of publication. The secondary nature of this material indicates that this a set of information not suitable for inclusion.

### **2. WGNHS P1590 Rock Thin-Sections**

The uploading of 1,833 metadata files in XML for P1590 was completed on September 28, 2012. The addition of these individual records was complicated by the switch at some time in 2012 to the USGS Sciencebase from the former Online Collection Inventory and National Digital Catalog. The WGNHS had not received notification of this change in database structure and data-input format. With assistance from NGGDPP Program staff, however, the files were successfully uploaded.

### **3. WGNHS Township and Range File**

The Township and Range File began as a series of geologic reports known as the Mineral Lands Classification or, alternatively, township reports. They were the result of fieldwork that was organized and then filed at the WGNHS office according to township and range locations. Because the Mineral Lands Classification reports were quite extensive, and because filing material by geographic location was standard practice at WGNHS for much of the twentieth century, these files became a repository for a variety of material that WGNHS wanted to preserve including highway blueprints, mine maps and valuations, reports on road materials and fieldwork for publications. Though the first township reports were done in 1913, the township and range files contain materials that are considerably older, especially those relating to lead and iron mining. Unfortunately, the details of the files' origin have been lost to time, so we know little about when or why the older materials were added. WGNHS stopped using these files as a miscellaneous repository at some time in the mid-1950s, though a small amount of material was added subsequently. Thus the Township and Range File does not comprise a single, cohesive collection, but represents a sometimes arbitrary assemblage of diverse materials.

### Inventory

Though USGS geologist Carl Dutton had produced a handwritten index of the files' contents in the late 1960s, this index was short on detail, and because it had been made so long ago, we were not sure how accurate it still might be. We concluded that a complete inventory of the files would have to be the first step.

Archivist Brad Gottschalk made a paper record of each item that included a brief description, its location by township and range, and its folder number. In the course of the inventory, he also moved the items from decaying folders into new file folders. Once the physical inventory was complete, we digitally re-organized the township-and-range folders with their highly variable content into subcollections. Some of the material was obviously closely related and fell into narrowly defined subcollections such as the township reports, while other material was gathered into subcollections that were more generally defined, such as mines and explorations. Eventually the files were organized into 18 subcollections: 12 narrowly defined and 6 of a more general nature. This part of the infrastructure development was completed from August through November 2011.

### Create an Electronic Record

After the completion of the physical inventory and the establishment of the subcollections, the next step was to put this information into an electronic format. An Excel spreadsheet was created as a first step towards developing a searchable Access database. The spreadsheet had three tables. The first was a general index with a series of fields that would capture the essential elements of the files including the basic location information for each item, a title, description, date, and information on its format (such as map, correspondence, log, and so forth). The two additional tables were for photograph numbers and for specimen numbers. They allow the index of the township and range files to be cross-referenced to the hand sample information in WGNHS Geobase and to the collection of historic photographs online with the UW-Madison Digital Collections. This work was completed in November 2011 to February 2012.

### Remove Extraneous Information

Once we had a complete inventory in an easily sortable electronic format, we organized the subcollections in to material that should be kept, material that would be a better to offer to other public organizations, and material of compromised value to be discarded. We established criteria for making this determination and decided that we would keep only material that would be of value to geological researchers. Material that was either only of historical interest or covered areas other than geology would be offered to other agencies or organizations. (One exception was the Correspondence subcollection which contains a large amount of material, mostly letters and short reports, some of which relate directly to Wisconsin geology, and some of which are only of historical interest. We concluded that the only way to safely "weed" this subcollection would be to go through it item by item, and that WGNHS did not have the resources to perform this task at that time, so the Correspondence sub-collection has been left in the files intact.) Four subcollections were removed in their entirety from the files, and a large part from a fifth was also removed. They were:

- a) Adjusted Profiles: Corrections to road elevations. This material will be offered to the Wisconsin Historical Society.
- b) ECW (Emergency Conservation Works) Maps: Maps of test wells drilled in state forests. These maps have been added to an existing WGNHS collection of ECW test well logs and maps.
- c) Industry Projects: This is a heterogeneous sub-collection consisting of items such as road plans, railway maps, maps of lots and owners, and transmission line maps. These will also be offered to the Wisconsin Historical Society
- d) Road Plans and Profiles: Blueprints of roads dating from 1912 to 1916. These will be offered to the Wisconsin Department of Transportation.
- e) Surface Water: Maps of lakes, rivers, streams, drainage, and dam construction plans. Part of this subcollection is being retained. Items not of interest to WGNHS hydrogeologists will be offered to the Department of Natural Resources.

This specific task was completed in February 2012.

#### Assign Keywords and Descriptions

When the contents of the Township and Range File had been finalized, an extensive list of possible keywords that could be used to search for content within the index was developed, assessed, and applied. The final list contains 11 name keywords to identify the work of several prominent geologists and 25 subject keywords. Appropriate keywords were applied to each item in the files. A summary description of the entire Township and Range File collection and a description of each subcollection was prepared between February and May 2012.

#### Database

The Excel spreadsheet containing the index of the Township and Range File is converted into an Access database that will be searchable by keyword and will allow the material in the files to be cross-referenced to the hand samples in WGNHS Geobase and to the historical photographs at the UW-Madison Digital Collections. This work was started in May 2012 and continues to the present.

#### Results

Though we concluded that we did not have items in the Township and Range File that would be appropriate for the National Digital Catalog, we successfully rescued, indexed, and provided access to a wide range of secondary research materials, including, most notably, the township reports themselves. Also, the specimen and outcrop descriptions in the township reports provide detailed information regarding rock samples already in the NDC, and these descriptions can be linked, by specimen number, directly from the Township and Range File index to WGNHS Geobase and then to the NDC records. In addition, a large number of geological reports, cross sections, drill hole logs and sections, maps from mines, and general geological maps have been identified, described, and cataloged.

#### 4. Final Technical Report

This document constitutes the Final Technical Report for the State of Wisconsin NGDPP FY2011 Project for Program Announcement No. 11HQA0014.